

What is claimed is:

1. A method for forming a conductive film of a semiconductor device comprising:

i) nitrifying a semiconductor substrate on which a tungsten film having a partially oxidized surface is formed, to form a tungsten nitride film on the surface of the tungsten film;

ii) oxidizing the surface of the tungsten film having the tungsten nitride film to change the tungsten nitride film into a tungsten oxy-nitride film; and

iii) removing the tungsten oxy-nitride film and any residue generated by a reaction of tungsten from the surface of the tungsten film, to form a tungsten film.

2. The method for forming a conductive film of a semiconductor device as claimed in claim 1, wherein (i) is performed through a rapid thermal nitrification method or a plasma process using a gas including a nitrogen compound.

3. The method for forming a conductive film of a semiconductor device as claimed in claim 2, wherein the plasma process is performed at an energy of approximately 200 to 1000 W using at least one reaction gas selected from the group consisting of NH_3 gas, NF gas and N_2 gas.

4. The method for forming a conductive film of a semiconductor device as claimed in claim 1, wherein (ii) is performed through a rapid thermal oxidization process or a plasma process using an oxygen gas.

5. The method for forming a conductive film of a semiconductor device as claimed in claim 1, wherein the tungsten oxy-nitride film is removed using an etching solution for etching oxide in (iii).

6. The method for forming a conductive film of a semiconductor device as claimed in claim 5, wherein the etching solution comprises hydrofluoric acid or a mixture of hydrofluoric acid and hydrogen peroxide.

7. A method for forming a conductive pattern of a semiconductor device comprising:

i) forming a conductive film mainly composed of tungsten on a semiconductor substrate;

ii) forming a photo resist pattern on the conductive film;

iii) forming a conductive pattern by etching the conductive film using the photo resist pattern as an etching mask;

iv) removing the photo resist pattern while a surface of the conductive pattern is partially oxidized;

v) nitrifying the conductive pattern including the partially oxidized surface to change the tungsten in the surface of the conductive pattern into a tungsten nitride film;

vi) oxidizing the conductive pattern including the tungsten nitride film formed thereon to change the tungsten nitride film formed on the surface of the conductive pattern into a tungsten oxy-nitride film; and

vii) forming a conductive pattern without an oxide on the conductive pattern by removing the tungsten oxy-nitride film.

8. The method for forming a conductive pattern of a semiconductor device as claimed in claim 7, wherein the conductive film comprises a tungsten film and a tungsten silicide film.

9. The method for forming a conductive pattern of a semiconductor device as claimed in claim 7, wherein (v) is performed by a rapid thermal nitrification process or a plasma process using a gas including a nitrogen compound.

10. The method for forming a conductive pattern of a semiconductor device as claimed in claim 9, wherein the plasma process is performed at an energy of approximately 200 to 1000 W using at least one reaction gas selected from the group consisting of NH_3 gas, NF gas and N_2 gas.

11. The method for forming a conductive pattern of a semiconductor device as claimed in claim 7, wherein (vi) is performed by a rapid thermal oxidization process or a plasma process using an oxygen gas.

12. The method for forming a conductive pattern of a semiconductor device as claimed in claim 7, wherein the tungsten oxy-nitride film is removed using an etching solution for etching oxide in (vii).

13. The method for forming a conductive pattern of a semiconductor device as claimed in claim 12, wherein the etching solution comprises hydrofluoric acid or a mixture of hydrofluoric acid and hydrogen peroxide.

14. The method for forming a conductive pattern of a semiconductor device as claimed in claim 7, wherein (i) further comprises forming a silicon nitride film on the conductive film.

15. The method for forming a conductive pattern of a semiconductor device as claimed in claim 7, further comprising forming a nitride spacer at a side portion of the conductive pattern after (vii).

16. A method for forming a conductive pattern of a semiconductor device comprising:

i) forming a conductive film mainly composed of tungsten on a semiconductor substrate;

ii) forming a photoresist pattern on the conductive film;

iii) forming a conductive pattern on which the photoresist pattern is formed by etching the conductive film using the photoresist pattern as an etching mask;

iv) nitrifying the conductive pattern to change the tungsten in a side portion of the conductive pattern into a tungsten nitride film;

v) removing the photoresist pattern using a gas including oxygen, and simultaneously changing the tungsten nitride film into a tungsten oxy-nitride film; and

vi) forming a conductive pattern without an oxide on the conductive pattern by removing the tungsten oxy-nitride film.

17. The method for forming a conductive pattern of a semiconductor device as claimed in claim 16, wherein the conductive film comprises a tungsten film and a tungsten silicide film.

18. The method for forming a conductive pattern of a semiconductor device as claimed in claim 16, wherein (iv) is performed by a rapid thermal nitrification process or a plasma process using a gas including a nitrogen compound.

19. The method for forming a conductive pattern of a semiconductor device as claimed in claim 18, wherein the plasma process is performed at an energy of approximately 200 to 1000 W using at least one reaction gas selected from the group consisting of NH_3 gas, NF gas and N_2 gas.

20. The method for forming a conductive pattern of a semiconductor device as claimed in claim 16, wherein (v) is performed by a plasma process using an oxygen gas.

21. The method for forming a conductive pattern of a semiconductor device as claimed in claim 16, wherein the tungsten oxynitride film is removed using an etching solution for etching oxide in (vi).

22. The method for forming a conductive pattern of a semiconductor device as claimed in claim 21, wherein the etching solution comprises hydrofluoric acid or a mixture of hydrofluoric acid and hydrogen peroxide.

23. The method for forming a conductive pattern of a semiconductor device as claimed in claim 16, the step (i) further comprising forming a silicon nitride film on the conductive film.

24. The method for forming a conductive pattern of a semiconductor device as claimed in claim 16, further comprising forming a nitride spacer at a side portion of the conductive pattern after (vi).